

CLAIMS

1. Preform of a foamable laminate sheet comprising a core between two metal skin plates, said core comprising a foaming agent and a foamable metal, **characterised in**
5 **that the foamable metal comprises at least one foamable metal sheet and wherein the foaming agent is applied on at least one side of at least one foamable metal sheet.**
2. Preform of a foamable laminate sheet according to claim 1 **wherein** the core comprises a plurality of foamable metal layers, stacked on top of each other, which
10 layers are coated on at least one side of at least one foamable metal sheet, preferably wherein each foamable metal layer is coated on at least one side of the foamable metal sheet.
3. Preform of a foamable laminate sheet according to claim 2 **wherein** the core
15 comprises at least three foamable metal layers, preferably at least four foamable metal layers, more preferably at least five foamable metal layers.
4. Preform of a foamable laminate sheet according to any one of the claims 1 to 3
20 **wherein** the foamable metal is an aluminium-silicon alloy.
5. Preform of a foamable laminate sheet according to claim 4, **wherein** the aluminium-silicon alloy sheet is from an AA4000-series aluminium alloy, and preferably having a silicon content in the range of 4 to 14 wt.%, and more preferably in the range of 8 to 13 wt.%.
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6. Preform of a foamable laminate sheet according to claim 4 or 5, **wherein** the aluminium-silicon alloy sheet further comprises an alloying element as wetting agent and/or for modification of the silicon.

7. Preform of a foamable laminate sheet according to any one of claims 1 to 6, **wherein** said preform has been compressed prior to a foaming operation at elevated temperature.
- 5 8. Preform of a foamable laminate sheet according to any one of claims 1 to 7, **wherein** the foaming agent is a hydrogenatable metal wherein the metal is selected from the group consisting of Ti, Fe, Co, Al, Cu, Mg, W, Mn, Cr, Be or an alloy thereof.
- 10 9. Preform of a foamable laminate sheet according to claim any one of claims 4 to 8, **wherein** the foaming agent is in the form of titanium hydride (TiH₂) powder in a quantity of from 0.02 to 8 wt.% of the aluminium-silicon alloy sheet, and preferably in a quantity of 0.05 to 2.5%.
- 15 10. Preform of a foamable laminate sheet according to any one of claims 4 to 9, **wherein** at least one metal sheet or foil for lowering the melting point of the aluminium-silicon alloy during any subsequent foaming operation is further interposed between said metal layers.
- 20 11. Preform of a foamable laminate sheet according to claim 10, **wherein** the metal sheet or foil for lowering the melting point of the aluminium-silicon alloy is made of copper or copper-alloy.
- 25 12. Preform of a foamable laminate sheet according to any one of the claims 1 to 11, **wherein** one or both of the metal layers are selected from the group consisting of aluminium, aluminium alloy, carbon steel, stainless steel and titanium.
- 30 13. Preform of a foamable laminate sheet according to any one of the claims 1 to 12, **wherein** one or both of the metal layers is an aluminium brazing sheet, the aluminium brazing sheet comprising an aluminium core alloy clad on one or both sides with a brazing alloy, wherein the brazing alloy preferably is an AA4000-series

alloy, and wherein at least one layer of the brazing alloy faces the interposed aluminium-silicon alloy sheet.

14. Foamed laminate sheet structure comprising two metal skin plates having a foamed
5 aluminium-silicon alloy core structure, which foam structure has been produced with
the aid of a preform according to any one of claims 1 to 13.
15. Method for manufacturing a preform of a foamable laminate sheet according to any
one of claims 1 to 13, comprising the steps of
- 10 (a) providing at least one foamable metal sheet coated on at least one side with a
coating comprising a foaming agent;
- (b) assembling said at least one coated foamable metal sheet between two metal
layers into an assembly;
- 15 (c) applying a controlled load on top of said assembly for improving the bonding
between the coating and the foamable metal sheet and to form a preform,
wherein preferably the controlled load is applied in a rolling operation.
16. Method according to claim 15 wherein the foamable metal sheet is an aluminium-
silicon alloy.
- 20 17. Method according to claim 15 or 16, wherein the controlled load is applied in a hot
rolling operation at a temperature not exceeding 400°C, and preferably the preform is
reduced in thickness by at least 25% during the load applying operation.
- 25 18. Method according to any one of claims 15 to 17, wherein during assembling of the
assembly also at least one metal sheet or foil is interposed between the two metal skin
plates for lowering the melting point of the foamable metal during any subsequent
foaming operation.
- 30 19. Method according to any one of claims 15 to 18, wherein during step (c) the
resulting preform is provided in the form of a coiled preform.